CLAIMS:

1. A transmission system for transmitting a multilevel signal (x_k) from a transmitter (10) to a receiver (20), the transmitter (10) comprising a mapper (16) for mapping an input signal (i_k) according to a signal constellation onto the multilevel signal (x_k), the receiver (20) comprising a demapper (22) for demapping the received multilevel signal (y_k) according to the signal constellation, wherein the signal constellation comprises a number of signal points with corresponding labels, and wherein $D_a > D_f$, with D_a being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with D_f being the minimum of the Euclidean distances between all pairs of signal points.

2. The transmission system according to claim 1, wherein D_a has a substantially maximum value.

3. The transmission system according to claim 1 or 2, wherein $\overline{H_1}$ has a substantially minimum value, with $\overline{H_1}$ being the average Hamming distance between all pairs of labels corresponding to neighboring signal points.

4. The transmission system according to claim 1 or 2, wherein the signal constellation is a 16-QAM signal constellation as depicted in any one of the Figs. 8A to 8G or an equivalent signal constellation thereof.

5. The transmission system according to claim 1 or 2, wherein the signal constellation is a 64-QAM signal constellation as depicted in any one of the Figs. 9A to 9C and 10 or an equivalent signal constellation thereof.

6. The transmission system according to claim 1 or 2, wherein the signal constellation is a 256-QAM signal constellation as depicted in any one of the Figs. 11A and 11B or an equivalent signal constellation thereof.

7. The transmission system according to claim 1 or 2, wherein the signal constellation is a 8-PSK signal constellation as depicted in any one of the Figs. 12A to 12C or an equivalent signal constellation thereof.

8. A transmitter (10) for transmitting a multilevel signal (x_k), the transmitter (10) comprising a mapper (16) for mapping an input signal (i_k) according to a signal constellation onto the multilevel signal (x_k), wherein the signal constellation comprises a number of signal points with corresponding labels, and wherein $D_a > D_f$, with D_a being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with D_f being the minimum of the Euclidean distances between all pairs of signal points.

9. The transmitter (10) according to claim 8, wherein D_a has a substantially maximum value.

10. A transmitter (10) according to claim 8 or 9, wherein $\overline{H_1}$ has a substantially minimum value, with $\overline{H_1}$ being the average Hamming distance between all pairs of labels corresponding to neighboring signal points.

11. A receiver (20) for receiving a multilevel signal (y_k), the receiver (20) comprising a demapper (22) for demapping the multilevel signal (y_k) according to a signal constellation, wherein the signal constellation comprises a number of signal points with corresponding labels, and wherein $D_a > D_f$, with D_a being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with D_f being the minimum of the Euclidean distances between all pairs of signal points.

12. The receiver (20) according to claim 11, wherein D_a has a substantially maximum value.

13. The receiver (20) according to claim 11 or 12, wherein $\overline{H_1}$ has a substantially minimum value, with $\overline{H_1}$ being the average Hamming distance between all pairs of labels corresponding to neighboring signal points.

14. A mapper (16) for mapping an input signal (i_k) according to a signal constellation onto a multilevel signal (x_k), wherein the signal constellation comprises a number of signal points with corresponding labels, and wherein $D_a > D_f$, with D_a being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with D_f being the minimum of the Euclidean distances between all pairs of signal points.

15. The mapper (16) according to claim 14, wherein D_a has a substantially maximum value.

16. The mapper (16) according to claim 14 or 15, wherein $\overline{H_1}$ has a substantially minimum value, with $\overline{H_1}$ being the average Hamming distance between all pairs of labels corresponding to neighboring signal points.

17. A demapper (22) for demapping a multilevel signal (y_k) according to a signal constellation, wherein the signal constellation comprises a number of signal points with corresponding labels, and wherein $D_a > D_f$, with D_a being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with D_f being the minimum of the Euclidean distances between all pairs of signal points.

18. The demapper (22) according to claim 17, wherein D_a has a substantially maximum value.

19. The demapper (22) according to claim 17 or 18, wherein $\overline{H_1}$ has a substantially minimum value, with $\overline{H_1}$ being the average Hamming distance between all pairs of labels corresponding to neighboring signal points.

20. A method of transmitting a multilevel signal (x_k) from a transmitter (10) to a receiver (20), the method comprising the steps of :

- mapping an input signal (i_k) according to a signal constellation onto the multilevel signal (x_k),

- transmitting the multilevel signal (x_k),
- receiving the multilevel signal (y_k) and
- demapping the multilevel signal (y_k) according to the signal constellation, wherein the signal constellation comprises a number of signal points with corresponding labels, and wherein $D_a > D_f$, with D_a being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with D_f being the minimum of the Euclidean distances between all pairs of signal points.

21. The method according to claim 20, wherein D_a has a substantially maximum value.

22. The method according to claim 20 or 21, wherein $\overline{H_1}$ has a substantially minimum value, with $\overline{H_1}$ being the average Hamming distance between all pairs of labels corresponding to neighboring signal points.

23. A multilevel signal, the multilevel signal being the result of a mapping of an input signal (i_k) according to a signal constellation, wherein the signal constellation comprises a number of signal points with corresponding labels, and wherein $D_a > D_f$, with D_a being the minimum of the Euclidean distances between all pairs of signal points whose corresponding labels differ in a single position, and with D_f being the minimum of the Euclidean distances between all pairs of signal points.

24. The multilevel signal according to claim 23, wherein D_a has a substantially maximum value.

25. The multilevel signal according to claim 23 or 24, wherein $\overline{H_1}$ has a substantially minimum value, with $\overline{H_1}$ being the average Hamming distance between all pairs of labels corresponding to neighboring signal points.

26. The multilevel signal according to claim 23 or 24, wherein the signal constellation is a 16-QAM signal constellation as depicted in any one of the Figs. 8A to 8G or an equivalent signal constellation thereof.

27. The multilevel signal according to claim 23 or 24, wherein the signal constellation is a 64-QAM signal constellation as depicted in any one of the Figs. 9A to 9C and 10 or an equivalent signal constellation thereof.

28. The multilevel signal according to claim 23 or 24, wherein the signal constellation is a 256-QAM signal constellation as depicted in any one of the Figs. 11A and 11B or an equivalent signal constellation thereof.

29. The multilevel signal according to claim 23 or 24, wherein the signal constellation is a 8-PSK signal constellation as depicted in any one of the Figs. 12A to 12C or an equivalent signal constellation thereof.